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FISH & GAME DEPARTMENT

Joseph C. Greenley, Director

FEDERAL AID IN FISH AND WILDLIFE RESTORATION

JOB PERFORMANCE REPORT

LAKE AND RESERVOIR INVESTIGATIONS Project F-53-R-9

Job No. III-c Evaluation of Fish Populations in Anderson Ranch Reservoir

Job No. III-d Experimental Introduction of Smallmouth Bass
into Anderson Ranch Reservoir

by

Donald R. Beach Fishery Research Biologist

February, 1974

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JOB PERFORMANCE REPORT

State of Idaho

Project No. F-53-R-9

Job No. III-c

Name: LAKE AND RESERVOIR INVESTIGATIONS

Title: Evaluation of Fish Populations in Anderson Ranch Reservoir

Period Covered: March 1, 1973 to February 28, 1974

ABSTRACT:

The creel census at Anderson Ranch Reservoir in 1973 yielded estimates of 41,933 total hours fished by all fishermen to catch 31,122 fish. Boat anglers fished 35,238 hours and harvested 392 rainbow trout, 25,073 kokanee, 1,190 squawfish and 110 yellow perch. Bank anglers fished 6,695 hours and harvested 1,849 rainbow trout, 1,343 squawfish, 1,089 yellow perch and 73 smallmouth bass. Both boat and bank angling pressure were down slightly from 1972.

Gill net sampling in the reservoir indicates a large population of kokanee. The average length of each age class has decreased drastically during the last year. An over population of kokanee for the amount of avail-able plankton is indicated as the cause.

Squawfish showed up in the angler catch at the lowest rate since 1968. Submitted by:

Donald R. Beach
Fishery Research Biologist

RECOMMENDATIONS:

Continue the creel census and gill netting portions of this project to monitor fish population trends at Anderson Ranch Reservoir.

Continue planting smallmouth bass to increase the existing population.

Continue to block kokanee spawning runs in the South Fork of the Boise River in an effort to reduce the kokanee population size in the reservoir.

Plant Dolly Varden in the reservoir to increase the resident population that now exists in order to provide anglers with a trophy type fish and to possibly prey on juvenile kokanee.

OBJECTIVES:

To monitor trends in Anderson Ranch Reservoir fish populations and relate these to squawfish control projects and recent introductions of game fish.

TECHNIQUES USED:

Creel Census

Census techniques and methods of estimating total fishing effort were about the same as those used at Anderson Ranch Reservoir in previous years. We censused every weekend day and holiday and 4 of 10 weekdays during each of seven 2-week intervals from May 27 through September 1, 1973. Estimates are for this period only and no expansion factors were used to project total effort and harvest for the entire year. On each census day, the census clerk traveled the length of the reservoir (by boat) four times, counting all boat and bank anglers. The counts, started at 8:00 a.m., 10:00 a.m., 2:00 p.m., and 4:00 p.m. each day. We employed factors from a similar census conducted in 1969 to account for fishermen fishing earlier or later than our counts.

We interviewed anglers during and between counts to determine numbers of hours fished and fish caught. By expanding the average number of anglers per count and average catch rates, we estimated the total effort and catch for each 2-week interval.

Species Composition

We sampled the reservoir with experimental gill nets which were fished at established shoreline stations and with vertical gill nets at established mid-reservoir stations (Figure 1).

Age and Growth

We measured kokanee and squawfish taken by fishermen and in gill nets and recorded length frequency distributions for comparisons with previous years' samples. Otoliths were collected from kokanee and age was determined by reading the annuli.

Population Trends

By comparing year-to-year catches of anglers and gill nets, we monitored trends in fish populations at Anderson Ranch Reservoir.

Hatchery Releases

During 1973, federal hatchery personnel released 15,000 rainbow trout catchables into Anderson Ranch Reservoir (Table 1).

FINDINGS:

Angler Pressure

From May 27 to September 1, 1973, anglers spent an estimated 41,933 hours fishing at Anderson Ranch Reservoir (Table 2). Boat anglers expended 84% (35,238 hours) of the total fishing effort at Anderson Ranch Reservoir in 1973 and caught 86% (26,768) of the total catch (Table 3). Bank angling activity was greatest around the first of June while boat angling peaked around the first of June (Table 4). Boat angling pressure was the lowest recorded since 1971. This can be partially attributed to a shorter census period and possibly to the smaller average size of the kokanee, which is the most sought after species in the reservoir (Figure 2).

Angler Harvest Composition

During the 1973 census period, anglers caught 2,241 rainbow trout, 25,073 kokanee, 1,199 yellow perch, 76 smallmouth bass and 2,533 squawfish (Table 2). Boat anglers caught 392 rainbow trout, 25,073 kokanee, 110 yellow perch, 3 smallmouth bass and 1,190 squawfish from Anderson Ranch Reservoir during the 1973 census period. Bank anglers, fishing the same period, caught 1,849 rain-bow, 1,089 yellow perch, 73 smallmouth bass and 1,343 squawfish (Tables 3 and 4).

Kokanee outnumbered squawfish 10 to 1 in the total sport catch in 1973. Kokanee made up 80.6% of the total catch while squawfish, rainbow trout, yellow perch and smallmouth bass made up 8.1%, 7.2%, 3.9% and 0.2% of the catch, respectively (Table 2).

The kokanee catch for boat anglers in 1973 was down about 2,000 fish from that of 1972. This can be attributed to a reduction in angling pressure during 1973. Rainbow trout harvest estimates for boat anglers during 1973 were the lowest ever recorded at Anderson Ranch Reservoir. The reason for the boat angler trout fishery decline is not known. Catchable trout releases were at a level comparable to previous year's plants. Many anglers are fishing specifically for kokanee and are possibly not getting into the good trout areas. Bank angling success for rainbow was comparable with estimates from other years (Table 5).

Fewer squawfish were caught in 1973 than ever before. There has been a drastic decline in the numbers of squawfish caught since 1968 (Figure 3 and Table 5).

Yellow perch continued to make a significant contribution to the bank angler catch, although numbers of perch caught were down from 1972. Negligible numbers of Dolly Varden, suckers and whitefish were recorded in the 1973 creel census.

During the 1973 creel census, boat anglers caught 93.7% kokanee, 4.4% squawfish, 1.5% rainbow trout, 0.4% yellow perch and less than 1% smallmouth bass. Bank anglers caught 42.5% rainbow, 30.8% squawfish, 25% yellow perch and 1.7% smallmouth bass. No kokanee were caught by bank anglers (Tables 6 and 7).

Table 8 shows a comparison of the percentage composition of the angler harvest from 1968-73 at Anderson Ranch Reservoir. Kokanee catches continue to increase while squawfish and rainbow trout catches become more in-significant to boat anglers. Rainbow trout are the most important species to bank anglers with a gradual increase in percentage of yellow perch being caught the last 2 years. Squawfish continue to make up a smaller percentage of the shore angler catch.

Catch Rates

As in past years, rainbow trout catch rates were best for boat anglers in the spring (Table 9). As the summer progresses, rainbow concentrate at creek mouths and produce the best bank angling (Table 10). Kokanee fishing was best during the latter part of June. Kokanee catch rates throughout the summer were consistently higher than in 1972 (Table 11). Higher kokanee catch rates can be attributed to better fishing techniques used by anglers and to an increasing kokanee population.

Squawfish catch rates continue to decrease for both boat and bank anglers. During the 1973 census, boat anglers caught less than 0.1 squawfish per hour while bank anglers caught 0.2 squawfish per hour. The highest catch rate on squawfish for boat and bank anglers occurred during the latter part of July (Tables 9 and 10).

Species Composition and Distribution

Horizontal gill nets that were fished for 120 hours at standard locations in Anderson Ranch Reservoir during 1973 caught 42.4% kokanee, 37.7% squawfish, 12% chiselmouth, 4.2% suckers, 2.8% yellow perch and 0.9% rainbow trout (Table 12). The percentage of squawfish in the gill net catch was up slightly over the 1972 percentage, but far below the last 5 years' average (Pollard, 1973).

A high percentage of kokanee spawners were caught in experimental gill nets during 1973. Pollard (1972, 1973) found that less than 20% of his experimental gill net catch was kokanee. This high percentage of spawners indicates an extremely large adult kokanee population in the reservoir this year.

Gill net catches of yellow perch made a significant jump in 1972 over 1971. During 1972 it appeared that the perch population was increasing. Catches during 1973 indicate a decrease back to the percentage of 2.8% which was found in 1971.

Vertical gill net sets in September, 1973, at standard sampling stations on Anderson Ranch Reservoir caught 80.7% kokanee, 14.1% squawfish, 3.3% suckers, 1.6% yellow perch and 0. 3% chiselmouth (Table 13). Kokanee were taken mostly below 50 feet in warmer water temperatures than usual. Water temperatures at 100 feet in depth are normally 8 C to 9 C during September, but were 10.5 C to 11 C during September, 1973 (Table 14).

Kokanee Survival and Growth

The kokanee population has continued to increase since they were introduced in 1965. Pollard (1972, 1973) found three age classes present in the reservoir during 1971 and 1972. In September these age classes were: Age 0, modal length 125-129 mm; Age I, modal length 260-264 mm; and Age II, modal length 385-389 mm. During the 1970-71 census periods, anglers caught mostly kokanee in the Age Class II category. Pollard found a larger number of Age Class I fish entering the catch than the larger Age Class II. The Age Class I kokanee were the offspring of a large spawning run in 1970.

In 1973, the kokanee population structure at Anderson Ranch had changed again. The large kokanee which had been Age Class II kokanee had all but disappeared in the angler catch (Figure 4). The catch was made up of mainly one age class through the first week in July. At this time, another smaller age class started entering the sport catch and as more of the fish in this smaller group grew to catchable size, they made up an increasingly larger percentage of the catch.

Vertical gill nets set once a month off the mouth of Wood Creek showed only two age classes of kokanee. Again, as the summer progressed, an increasing number of the smaller size group made up a larger percentage of the net catch (Figure 5).

Otoliths were taken from the different age groups indicated by the length frequencies mentioned previously. By reading annuli on the otoliths, it was determined that there were four age classes in the reservoir. We found no kokanee of Age Class 0 in either the sport or net catches. Age Class I had a mean length of 190.3 mm (7.6 inches) in August and Age Class II had a mean length of 283.7 mm (11.1 inches). Age Class III individuals were extremely scarce in the reservoir. Lengths of the six individuals from this age class ran from 384 mm to 440 mm.

Figure 6 shows the length frequency distribution of 195 kokanee spawners taken at a weir and trap on the South Fork of the Boise River during September, 1973. Three age classes were represented in the spawning run with a majority of the spawners being of Age Class II. Pollard (1973) found a high percentage of large kokanee (360 mm to 450 mm) in the 1972 spawning run. These large fish were also Age Class II. The tremendous decrease in size for each age class is an indication of a large decrease in the amount of available food.

There are a number of possible reasons for this plankton decline. Pollard (1970, 1971, 1972, 1973) found that the catch of kokanee more than doubled each year. This indicates tremendous increases in the population size. Kokanee in Anderson Ranch Reservoir have probably cropped the plankton to an

extremely low level. Otoliths taken from different age classes of kokanee show that the last growing year has been very poor. It is possible that the low flows of 1973 failed to bring in enough nutrients to the reservoir for good plankton production. Pollard (1971) found Age Class I kokanee grew 80 mm to 100 mm in the 3 summer months and Age Class II kokanee grew about 60 mm in the same period. During the 3 summer months of 1973, kokanee of Age Class I grew about 16 mm and Age Class II kokanee grew about 25 mm (Figure 5). This slow growth is the strongest indication of low food supplies and of an over population of kokanee in Anderson Ranch Reservoir. Further study of plankton production and more age-growth information is needed to validate or invalidate these theories.

Kokanee Population Control

During the 1973 census period; it appeared that the reduction in average size of the kokanee was probably caused by over population along with a poor food production year. When kokanee started to enter the South Fork of the Boise River on their spawning run, a weir and trap was constructed across the river approximately 1 mile below Wagontown. The main purpose of the weir was to trap all of the kokanee and take their spawn. The spawn would be hatched at the Eagle Fish Hatchery and only a certain number of fingerling kokanee would be released back into Anderson Ranch Reservoir in the spring of 1974. During the time that the weir was in place, it was noted that a substantial number of kokanee were dropping back downstream from the weir and spawning naturally. It appeared that the spawning that took place be-low the weir was sufficient to propagate the reservoir without an additional kokanee plant.

During the period that the weir was working, weather was extremely good. No major problems developed with leaves plugging the weir or with high water.
If blocking the kokanee run is going to be a major tool in population control, a permanent installation is needed on the South Fork that can stand high water and plugging problems better than our temporary portable weirs.

Squawfish Growth

Figure 7 shows the length frequency of 200 squawfish caught in experimental gill nets during September, 1973. Two main age classes showed up in the catch. Age Class,II had a modal length of 190 mm and Age Class IV a modal length of 310 mm. Age Class III had extremely low numbers. This may be attributed to a good kill of squawfish in 1970. During 1970, project personnel treated the shorelines of Anderson Ranch Reservoir three times with rotenone. Squawfish may have increased slightly in 1973, but fewer are being caught by anglers.

1/ The modal lengths used for defining age classes of squawfish were defined by Pollard (1970) at Anderson Ranch Reservoir. Pollard described Age Class II as having a modal length of 210 mm instead of the 190 mm that was found in 1973. The reduction in the modal length of the Age Class II squawfish in 1973 can be partly attributed to the reduction in food production in the reservoir during 1973.

LITERATURE CITED:

Pollard II, Herbert A., 1970. Survival and growth of kokanee and coho salmon in Anderson Ranch Reservoir (Job IV). Idaho Fish and Game Department.

Pollard II, Herbert A., 1971. Survival and growth of kokanee and coho salmon in Anderson Ranch Reservoir (Job III-b). Idaho Fish and Game Department.

Pollard II, Herbert A., 1972. Survival and growth of kokanee and coho salmon in Anderson Ranch Reservoir (Job III-b). Idaho Fish and Game Department.

Pollard II, Herbert A., 1973. Evaluation of fish population in Anderson Ranch Reservoir (Job III-c). Idaho Fish and Game Department.

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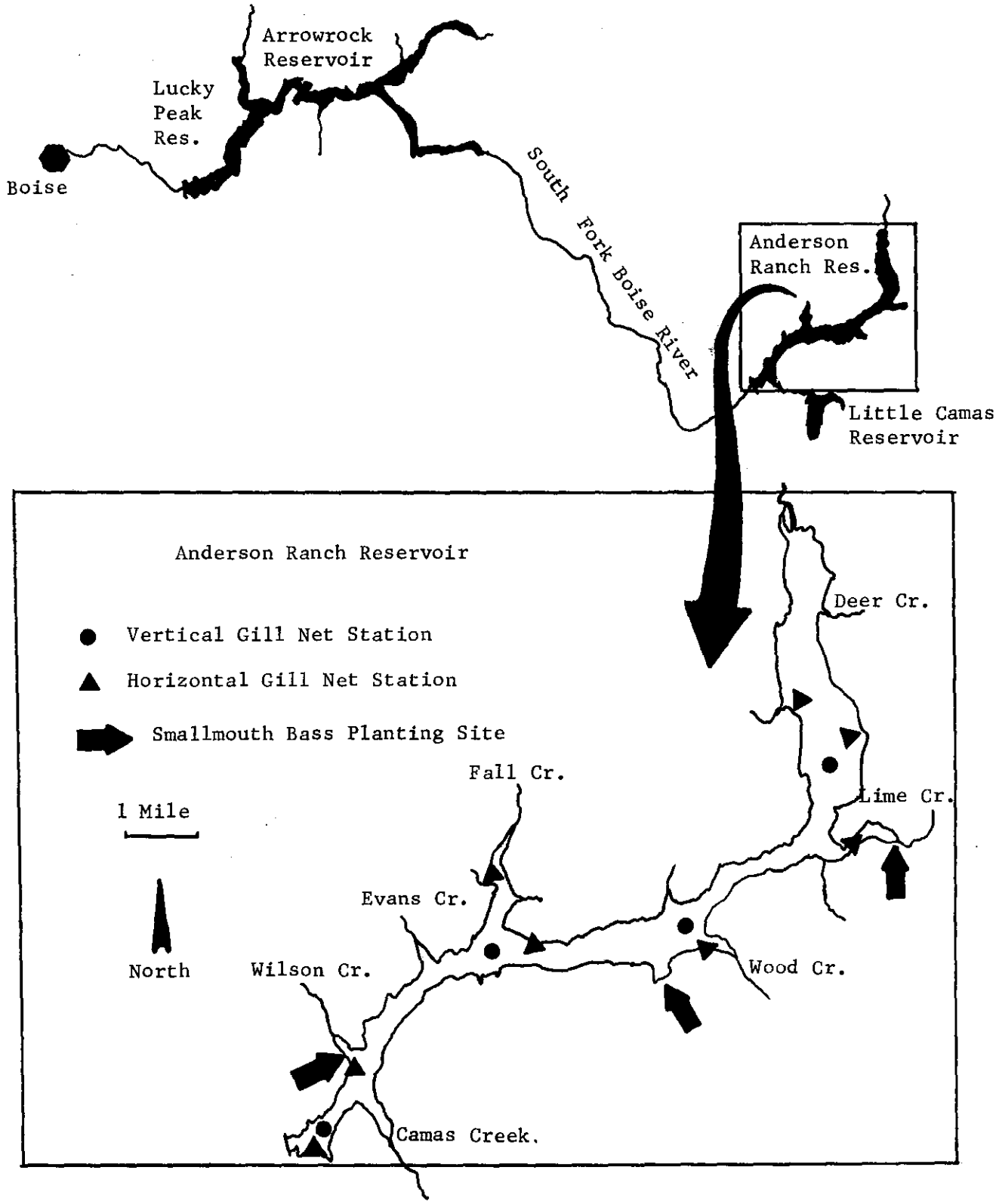

Figure 1. Location map of Anderson Ranch Reservoir showing gill net stations and smallmouth bass planting site.

Table 1. Hatchery plants and game fish catch estimates, 1965-1973, Anderson Ranch Reservoir.

Year	Number Planted			Number Caught		
	Kokanee	Coho	Rainbow[1]	Kokanee	Coho	Rainbow
1965	1,120,720	0	113,000	No Creel Census		Taken
1966	390,000	0	10,200[2]	"	"	"
1967	208,000	342,383	36,700	"	"	"
1968	124,740	351,330	35,862	2,518	3,640	6,067
1969	122,000	357,200	12,726	1,956	857	5,982
1970	200,000	350,000	12,000	7,618	152	3,193
1971[3]	0	0	11,037	16,225	5	1,918
1972	0	0	30,000[4]	27,027[5]	0	5,639
1973	0	0	15,000	25,073[6]	0	2,241

[1] Catchable size

[2] Plus 100,000 fingerlings

[3] 1971 estimates cover period May 15-August 20. Years 1968-1970 cover period May 15-October 31.

[4] Plus 25,000 catchables

[5] 1972 estimates cover period June 18-August 27

[6] 1973 estimates cover period May 27-September 1

Table 2. Estimates of total hours fished and catch by all anglers at Anderson Ranch Reservoir by 2-week creel census intervals, May 27-September 1, 1973.

Interval starting dates	Estimated total hours fished	Estimated catch[1/]					
		Rb	Kok	Sq	YP	Smb	Total
May 27	7,481	577	4,545	548	56	0	5,726
June 10	5,021	370	3,101	189	39	13	3,712
June 24	10,311	347	6,514	395	161	17	7,434
July 8	7,052	553	4,499	360	233	11	5,656
July 22	6,750	223	4,551	656	159	6	5,595
August 5	3,460	85	1,554	124	108	9	1,880
August 19	1,858	86	309	261	443	20	1,119
Totals	41,933	2,241	25,073	2,533	1,199	76	31,122
% Composition of catch		7.2	80.6	8.1	3.9	0.2	

[1/] Abbreviations utilized in this and following tables:

Rb -- Rainbow trout
Kok -- Kokanee
Sq -- Squawfish
YP -- Yellow Perch
Smb -- Smallmouth bass
Co -- Coho
Su -- Suckers
Cm -- Chiselmouth

Table 3. Estimates of total hours fished and catch by boat anglers at Anderson Ranch Reservoir by 2-week census intervals, May 27-September 1, 1973.

Interval starting dates	Estimated total hours fished	Estimated catch					
		Rb	Kok	Sq	YP	Smb	Total
May 27	5,432	185	4,545	288	6	---	5,024
June 10	4,455	36	3,101	85	--	---	3,222
June 24	9,266	93	6,514	222	--	---	6,829
July 8	6,024	66	4,499	66	11	---	4,642
July 22	5,887	12	4,551	365	71	---	4,999
August 5	3,076	---	1,554	96	10	---	1,660
August 19	1,098	---	309	68	12	3	392
Totals	35,238	392	25,073	1,190	110	3	26,768
% Composition of catch		1.5	93.7	4.4	0.4	< 0.1	

Table 4. Estimates of total hours fished and catch by bank anglers at Anderson Ranch Reservoir by 2-week creel census intervals, May 27-September 1, 1973.

Interval starting dates	Estimated total hours fished	Estimated catch				
		Rb	Sq	YP	Smb	Total
May 27	2,049	392	260	50	---	702
June 10	566	334	104	39	13	490
June 24	1,045	254	173	161	17	605
July 8	1,028	487	294	222	11	1,014
July 22	863	211	291	88	6	596
August 5	384	85	28	98	9	220
August 19	760	86	193	431	17	727
Totals	6,695	1,849	1,343	1,089	73	4,354
% Composition		42.5	30.8	25.0	1.7	

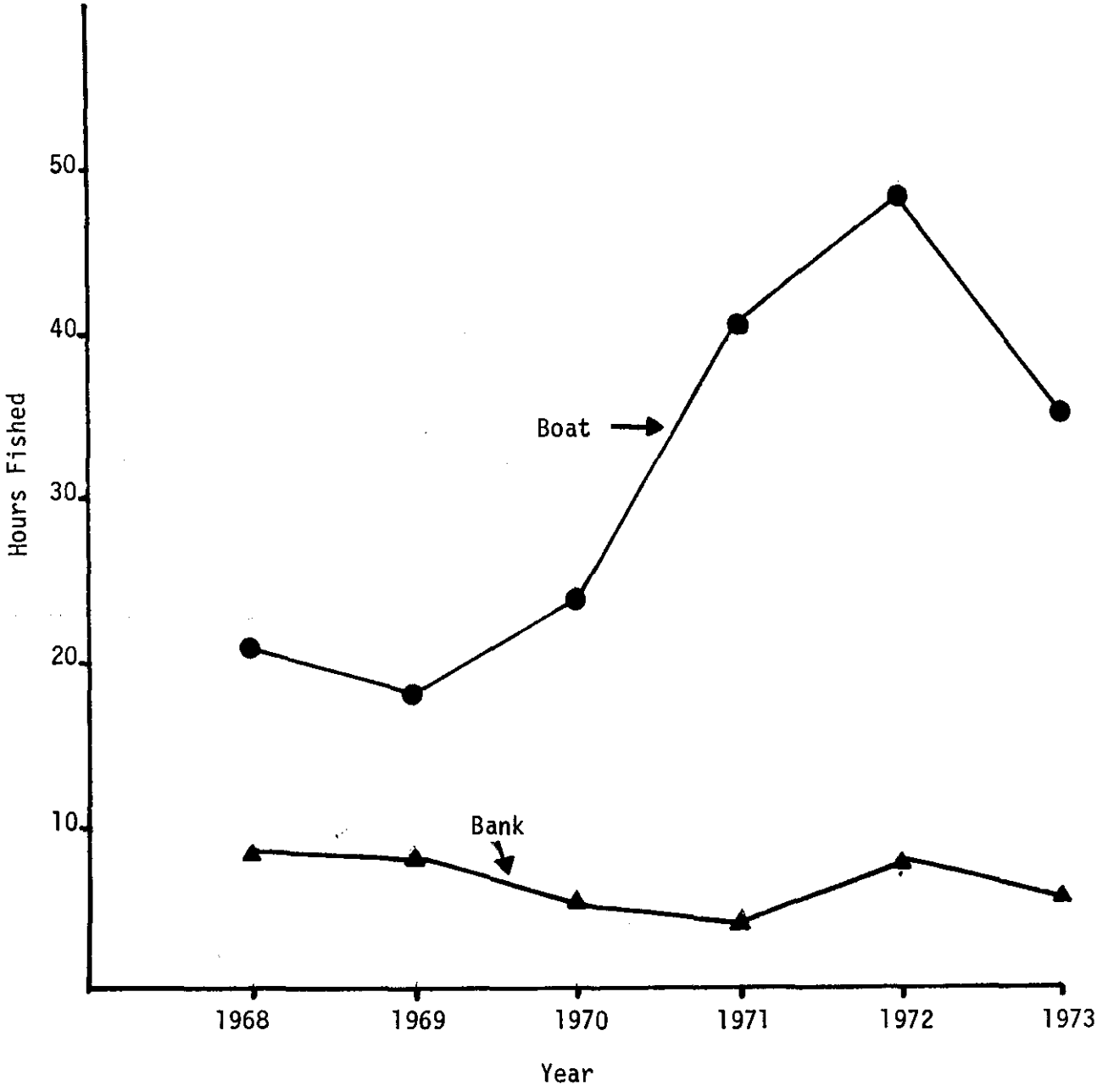

Figure 2. Estimated total hours fished by boat and bank anglers at Anderson Ranch Reservoir, 1968-1973.

Table 5. Estimates of total effort and catch of anglers at Anderson Ranch Reservoir, 1968-1973.

Boat Anglers

Year	Total Hours	RB	KOK	COHO	YP	SMB	SQ	Total
1968	21,115	3,944	2,420	2,623	1/	---	20,207	29,194
1969	18,940	3,391	1,946	770	1/	---	16,618	22,725
1970	24,479	1,932	7,234	147	1/	---	17,879	27,192
1971	37,933	1,429	16,225	5	1/	---	9,846	27,505
1972	48,542	2,089	27,027	---	763	---	5,044	34,923
1973	35,238	392	25,073	---	110	3	1,190	26,768

Bank Anglers

Year	Total Hours	RB	KOK	COHO	YP	SMB	SQ	Total
1968	8,523	2,123	98	1,017	1/	---	6,995	10,233
1969	8,106	2,480	10	87	1/	---	5,103	7,680
1970	5,134	1,284	384	5	1/	---	2,235	3,908
1971	3,250	489	0	0	1/	---	1,707	2,196
1972	7,819	3,550	0	0	1,954	2/	3,028	8,532
1973	6,695	1,849	0	0	1,089	73	1,343	4,354

1/ No estimates made for yellow perch during this year.

2/ Smallmouth bass introduced to Anderson Ranch.

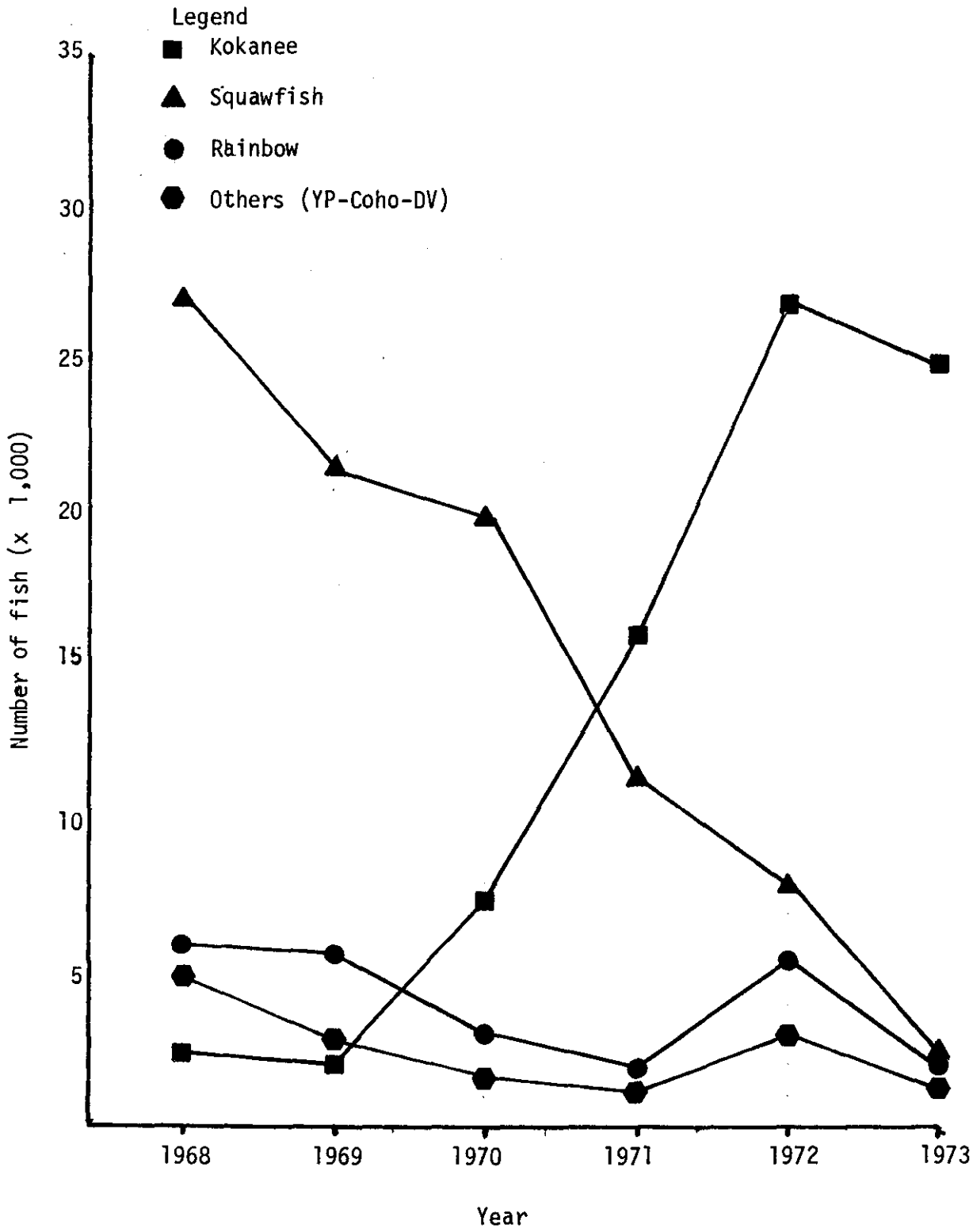

Figure 3. Estimated number of fish caught by anglers at Anderson Ranch Reservoir, 1968-1973.

Table 6. Percentage composition of boat anglers catch at Anderson Ranch Reservoir by 2-week creel census intervals, May 27-September 1, 1973.

Interval	Starting dates	Rb	Kok	Sq	YP	Smb
I	May 27	3.7	90.5	5.7	0.1	0.0
II	June 10	1.1	96.3	2.6	0.0	0.0
III	June 24	1.4	95.4	3.2	0.0	0.0
IV	July 8	1.4	96.9	1.4	0.3	0.0
V	July 22	0.2	91.0	7.3	1.5	0.0
VI	August 5	0.0	93.6	5.8	0.6	0.0
VII	August 19	0.0	78.8	17.3	3.1	.8
	Total	1.5	93.7	4.4	0.4	< 0.1

Table 7. Percentage composition of bank anglers catch at Anderson Ranch Reservoir by 2-week creel census intervals, May 27-September 1, 1973.

Interval	Starting dates	Rb	Sq	YP	Smb
I	May 27	55.9	37.0	7.1	0.0
II	June 10	68.2	21.2	8.0	2.6
III	June 24	42.0	28.6	26.6	2.8
IV	July 8	48.0	29.0	21.9	1.1
V	July 22	35.4	48.8	14.8	1.0
VI	August 5	38.6	12.7	44.6	4.1
VII	August 19	11.8	26.6	59.3	2.3
	Total	42.5	30.8	25.0	1.7

Table 8. Percent composition of angler catch, Anderson Ranch Reservoir, 1968-1973.

Boat Anglers

Year	Total Catch	Percent of Catch						
		Rb	Kok	Co	YP	Smb	Sq	Total
1968	29,194	13.6	8.9	11.4	1/	---	66.1	100.0
1969	22,725	14.9	8.6	3.4	1/	---	73.1	100.0
1970	27,192	7.1	26.6	0.5	1/	---	65.8	100.0
1971	27,514	5.2	59.0	< 0.1	1/	---	35.8	100.0
1972	34,923	6.0	78.0	0.0	2.0	2/	14.0	100.0
1973	26,768	1.5	93.7	0.0	0.4	<.01	4.4	100.0

Bank Anglers

Year	Total Catch	Percent of Catch						
		Rb	Co	Kok	YP	Smb	Sq	Total
1968	10,233	20.8	9.9	0.9	1/	---	68.4	100.0
1969	7,680	32.3	1.1	0.1	1/	---	66.5	100.0
1970	3,908	32.9	0.1	9.8	1/	---	57.2	100.0
1971	2,196	22.3	0.0		1/	---	77.7	100.0
1972	8,532	41.6	0.0		22.9	2/	35.5	100.0
1973	4,354	42.5	0.0		25.0	1.7	30.8	100.0

1/ No estimates made for yellow perch during this year.

2/ Smallmouth bass introduced to Anderson Ranch.

Table 9. Boat angler catch rates by 2-week creel census intervals at Anderson Ranch Reservoir, May 27 to September 1, 1973.

Interval	Starting date	Catch rate--Fish per hour					
		Rb	Kok	Sq	YP	Smb	Total
I	May 27	.03	.84	.05	<.01	.00	.92
II	June 10	.01	.70	.02	.00	.00	.73
III	June 24	.01	.95	.02	.00	.00	.98
IV	July 8	.01	.75	.01	<.01	.00	.77
V	July 22	<.01	.77	.06	.01	.00	.85
VI	August 5	.00	.50	.03	<.01	.00	.54
VII	August 19	.00	.28	.06	.01	<.01	.35
	Total	.01	.71	.03	<.01	<.01	.76

Table 10. Bank angler catch rates by 2-week creel census intervals at Anderson Ranch Reservoir, May 27-September 1, 1973.

Interval	Starting date	Catch rate--fish per hour				
		Rb	Sq	YP	Smb	Total
I	May 27	.19	.13	.02	.00	.34
II	June 10	.59	.18	.07	.02	.86
III	June 24	.24	.17	.15	.02	.58
IV	July 8	.47	.29	.22	.01	.99
V	July 22	.24	.34	.10	<.01	.69
VI	August 5	.22	.07	.26	.02	.57
VII	August 19	.11	.25	.57	.02	.95
	Total	.28	.20	.16	.01	.65

Table 11. Catch rates of all anglers at Anderson Ranch Reservoir, 1968-1973.

Boat Anglers

Year	Fish per hour						
	Rb	Kok	Co	YP	Smb	Sq	Total
1968	.18	.12	.15	1/	---	.88	1.33
1969	.18	.10	.04	1/	---	.88	1.20
1970	.08	.30	.01	1/	---	.73	1.14
1971	.04	.43	---	1/	---	.26	.73
1972	.04	.56	---	.02	2/	.10	.72
1973	.01	.71	---	<.01	<.01	.03	.77

Bank Anglers

Year	Fish per hour					
	Rb	Co	YP	Smb	Sq	Total
1968	.28	.13	1/	---	.76	1.17
1969	.31	.01	1/	---	.61	.93
1970	.25	.00	1/	---	.44	.69
1971	.15	.00	1/	---	.53	.68
1972	.45	.00	.25	2/	.39	1.09
1973	.28	.00	.16	.01	.20	.65

1/ No estimates made for yellow perch during this year.

2/ Smallmouth bass introduced to Anderson Ranch.

Table 12. Species composition of horizontal gill nets fished at standard sampling stations, Anderson Ranch Reservoir, September, 1973.

Location	Date	Species Composition						
		Sq	Cm	Su	Kok	YP	Rb	Total
Badger Creek	9/11	55	13	10	37	1	0	116
Perch Point	9/11	32	24	7	6	11	0	80
Lime Creek	9/12	24	3	1	21	0	0	49
Wood Creek	9/12	14	5	0	18	0	2	39
Castle Creek	9/13	8	4	0	20	0	1	33
Powerline	9/13	5	0	0	21	0	1	27
Wilson Creek	9/14	12	1	0	18	0	0	31
Forebay	9/14	11	1	0	40	0	0	52
Totals		161	51	18	181[1/]	12	4	427
% Composition		37.7	12.0	4.2	42.4	2.8	0.9	100.0
Catch per hour		1.34	.43	.15	1.50	0.10	0.03	3.55

1/ All kokanee were spawners except for two.

Table 13. Species composition of fish caught in five vertical gill net sets each night at each of four standard stations, Anderson Ranch Reservoir, September 11-September 14, 1973.

Location	Date	Species Captured					
		Kok	Sq	Su	YP	Cm	Total
Perch Point	9/11	31 (13)[1/]	5	9	5	--	50
Wood Creek	9/12	117 (5)[1/]	31	1	--	1	150
Fall Creek	9/13	62 (2)[1/]	6	--	--	--	68
Forebay	9/14	37 (5)[1/]	1	--	--	--	38
Totals		247 (25)[1/]	43	10	5	1	306
% Composition		80.7	14.1	3.3	1.6	0.3	100.0
Catch per hour		.78	.14	.03	.02	.003	

[1/] Denotes number of spawning kokanee caught.

Table 14. Temperature profile and vertical distribution of fish caught in 20 vertical gill net sets at Anderson Ranch Reservoir, September 11-September 14, 1973.

Depth (ft)	Temp. (°F)	Vertical distribution	Species				
			Kok	Sq	Su	YP	Cm
0	65-66	0-10	1	2	2		1
10	65-66	10-20	0	0		2	
20	65-66	20-30	2	3	1	1	
30	65-66	30-40	0	1			
40	65-66	40-50	12	2	2	2	
50	63-64	50-60	52	7	1		
60	60-61	60-70	76	12	1		
70	57-58	70-80	36	10	2		
80	56-57	80-90	31	4			
90	55-56	90-100	37	2	1		
100	53-54	Total	247	43	10	5	1

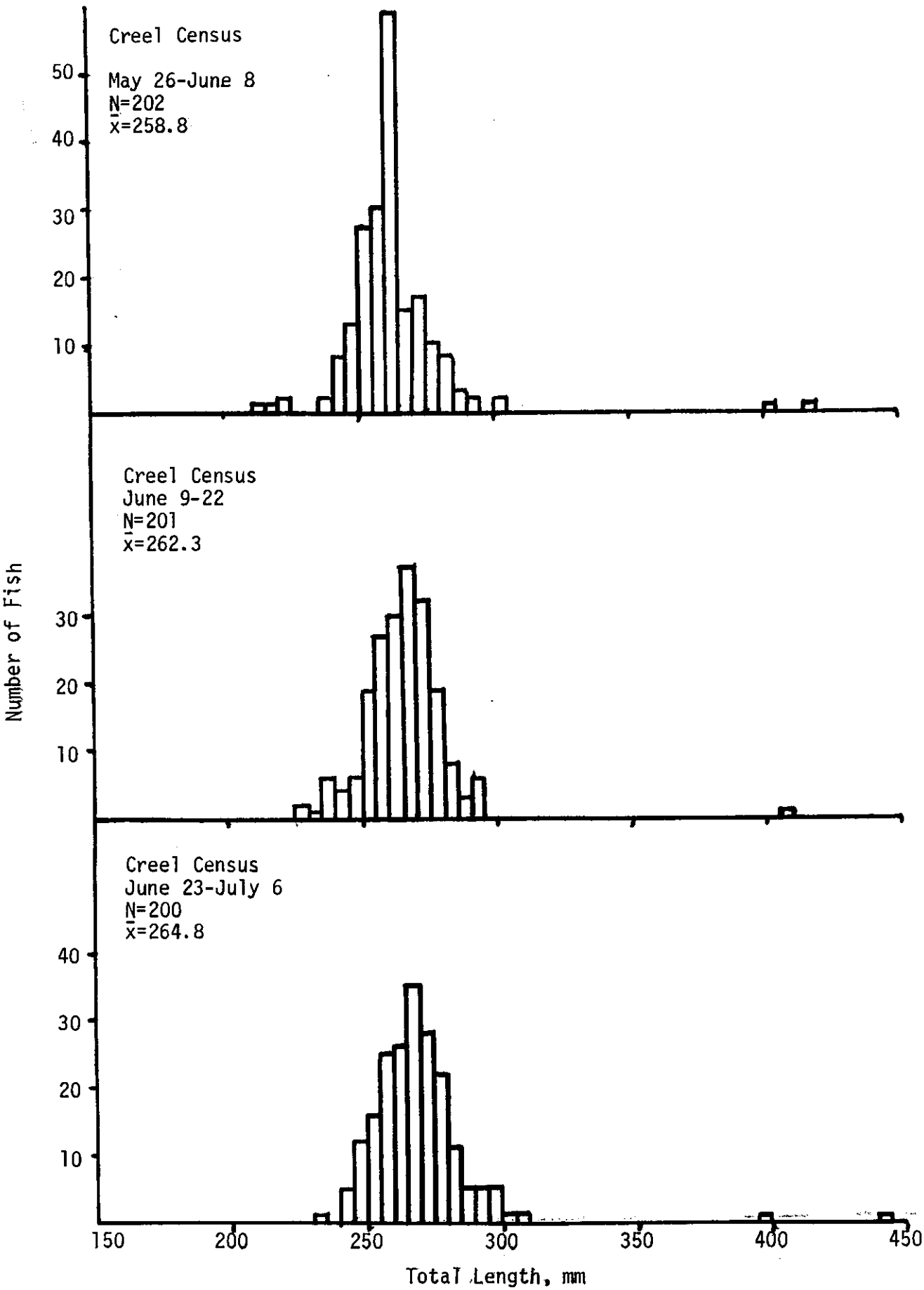

Figure 4. Length frequencies of kokanee caught by anglers at Anderson Ranch Reservoir, May-August, 1973 (continued on next page)

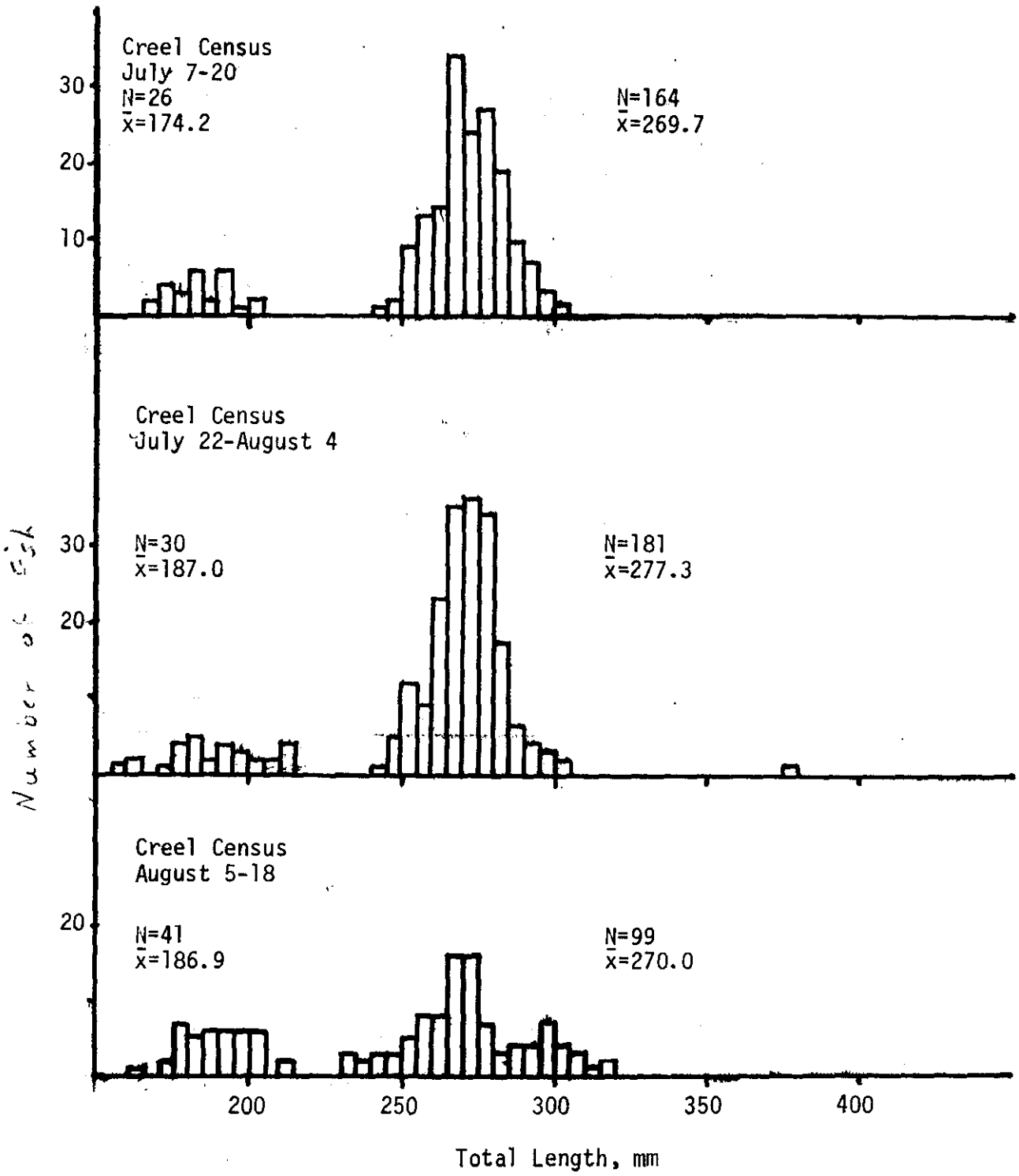

Figure 4 (continued). Length frequencies of kokanee caught by anglers at Anderson Ranch Reservoir, May-August, 1973.

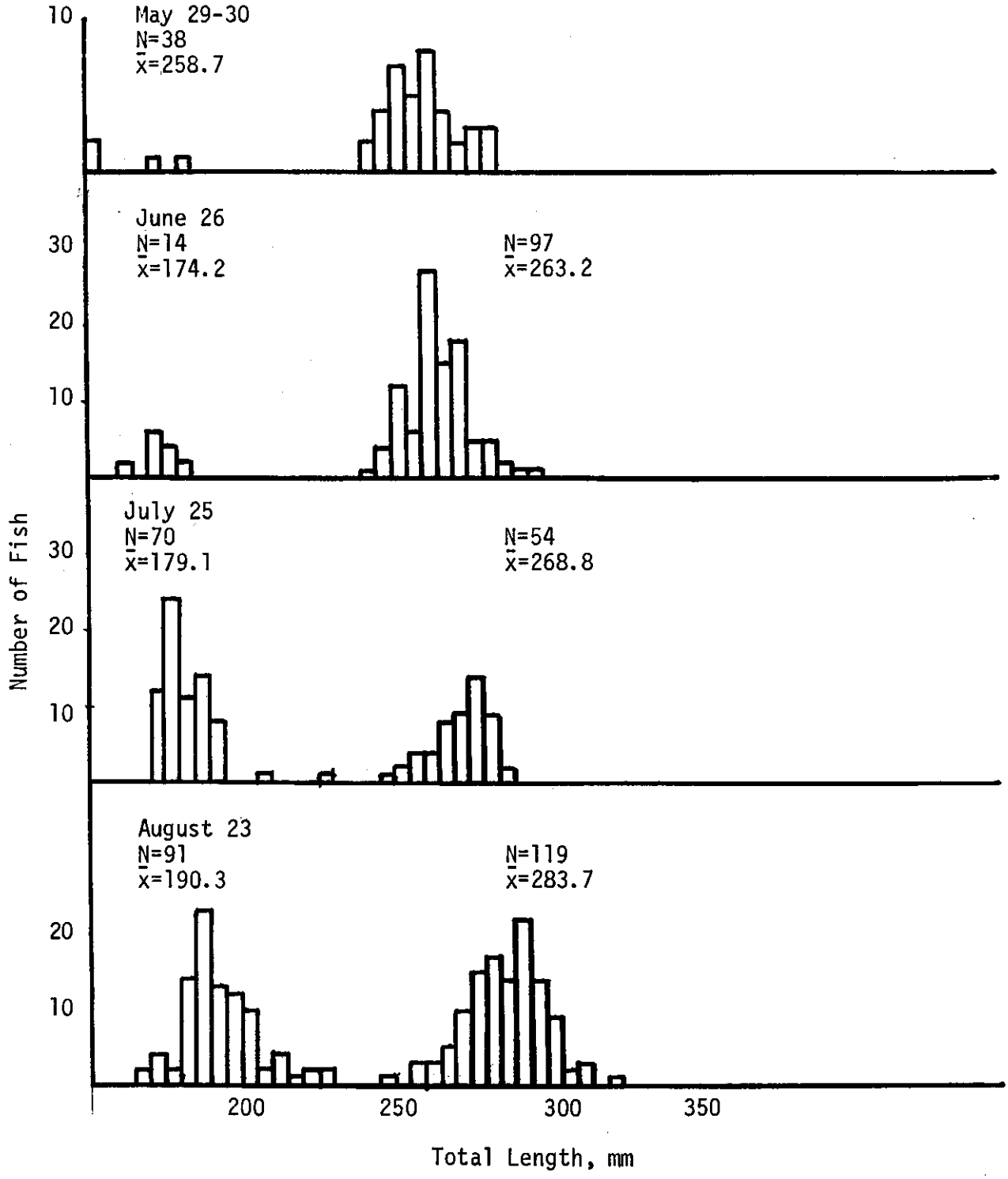

Figure 5. Length frequencies of kokanee caught in vertical gill nets in Anderson Ranch Reservoir, May-August, 1973.

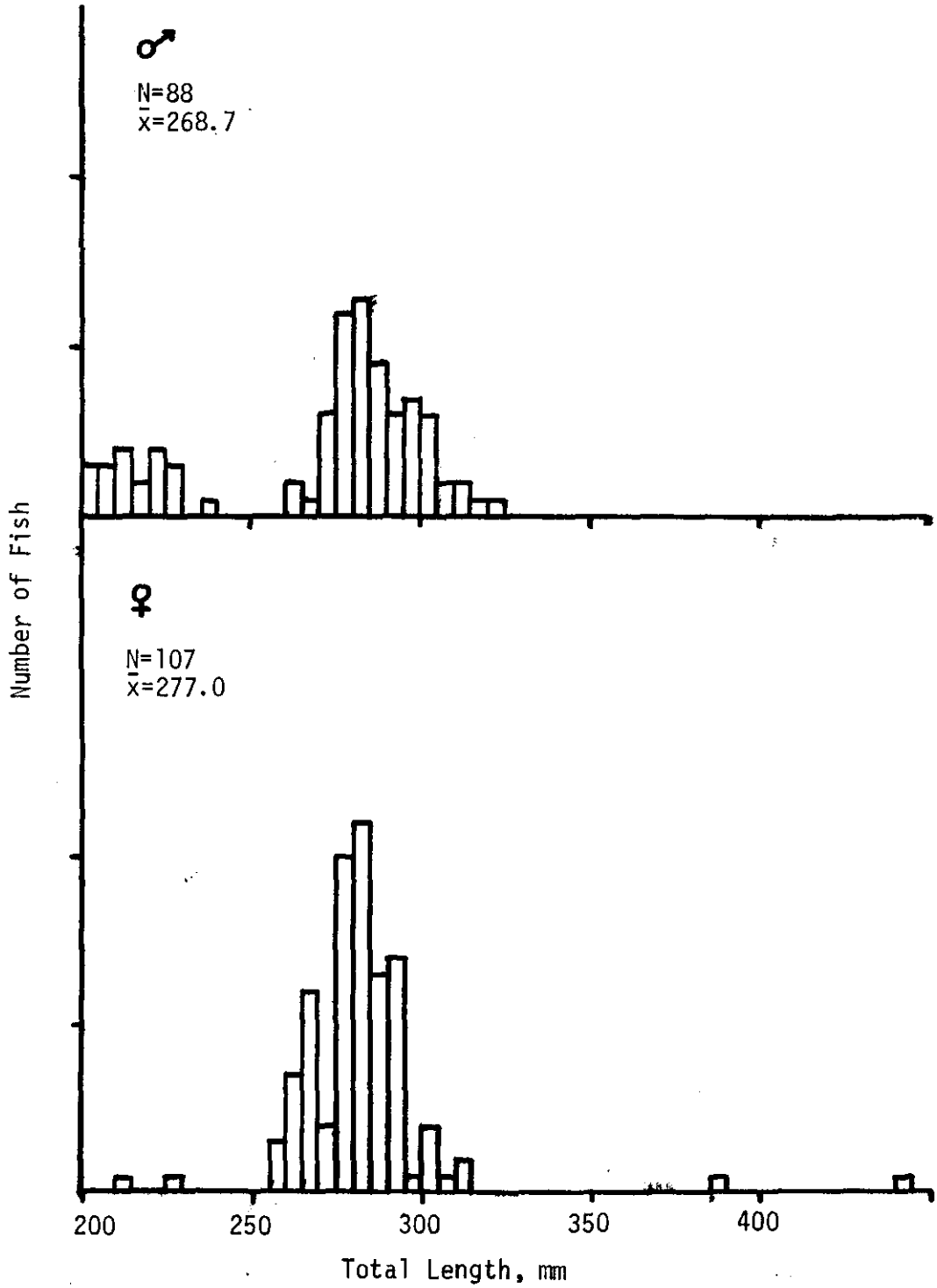

Figure 6. Length frequency distribution of spawning kokanee, South Fork of the Boise River, September, 1973.

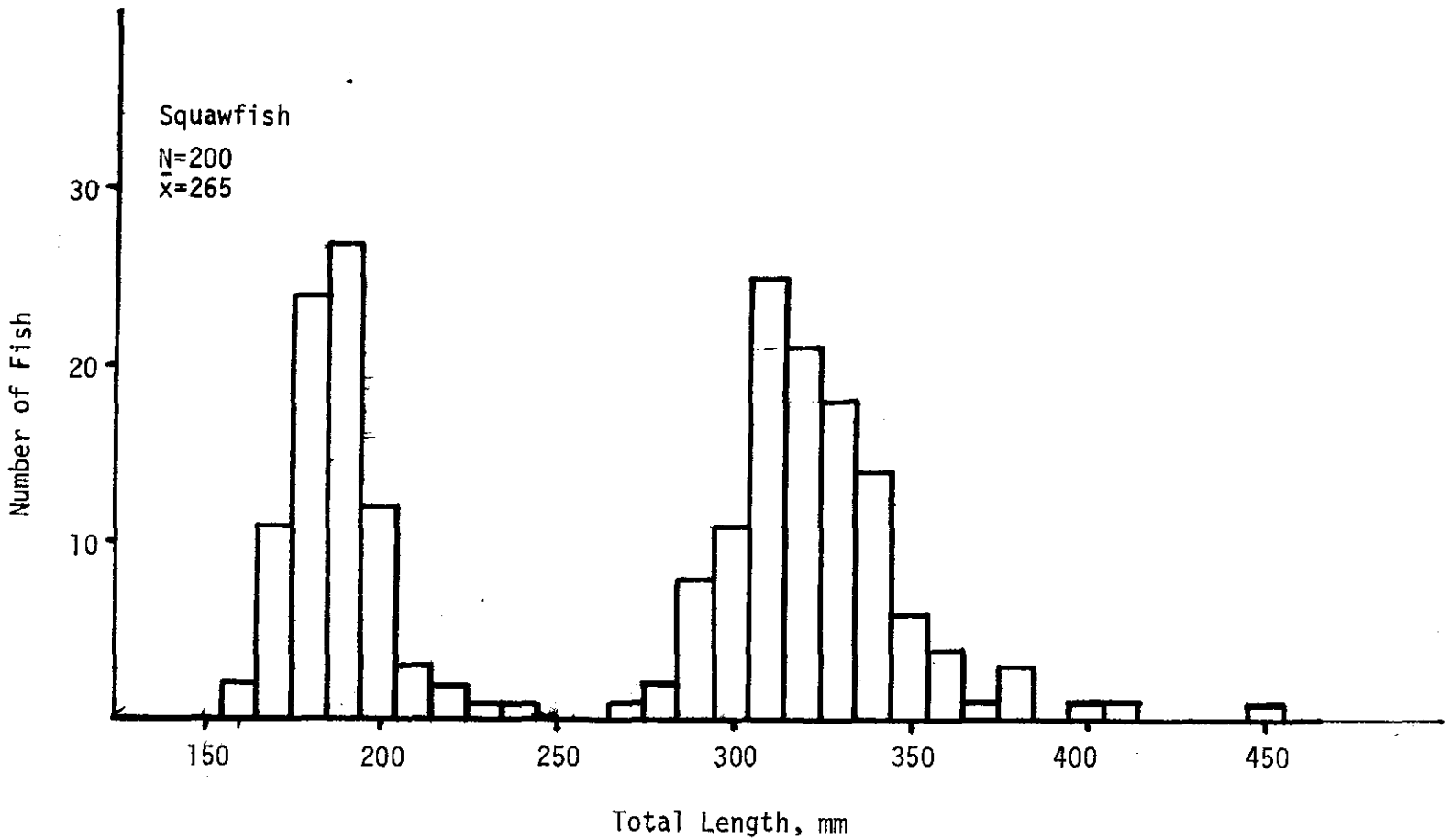

Figure 7. Length frequency distribution of 200 squawfish caught in gill nets at Anderson Ranch Reservoir, September, 1973.

JOB PERFORMANCE REPORT

State of	Idaho	Name:	LAKE AND RESERVOIR INVESTIGATIONS
Project No.	F-53-R-9	Title:	Experimental Introduction of Smallmouth Bass into Anderson Ranch Reservoir
Job No.	III-d		

Period Covered: March 1, 1973 to February 28, 1974

ABSTRACT:

Department personnel planted 450 adult smallmouth bass in the reservoir in 1973 and they appeared to adapt readily to the new water.

There was no evidence of bass spawning in the reservoir this year. Growth and condition of bass planted in 1972 was good. Stomach samples indicate that bass are preying on native cyprinides. Anglers took an estimated 73 bass in the bank fishery.

Submitted by:

Donald R. Beach
Fishery Research Biologist

RECOMMENDATIONS:

Attempts to increase the smallmouth bass population at Anderson Ranch Reservoir should be continued with transplants of adult bass from Brownlee Reservoir and plants of fingerling bass for 3 years as they are available.

Continue to monitor survival and growth of introduced smallmouth bass and their effect on native rough fish populations by underwater observations and by census and net data.

OBJECTIVES:

To collect and introduce smallmouth bass into Anderson Ranch Reservoir.

To monitor the survival, growth and reproductive potential of smallmouth bass.

To assess the value of smallmouth bass as a fishery and as a competitor-predator of rough fish.

TECHNIQUES USED:

Adult smallmouth bass were collected by hook-and-line in Brownlee Reservoir during June. We also attempted collecting smallmouth with electrofishing gear but had only limited success.

Underwater observations using a face mask and snorkel were made to locate spawning bass at Anderson Ranch Reservoir and to note dispersal of bass from planting sites.

Growth, survival and food habits were studied by underwater observations, gillnetting and creel checks.

A random count and angler interview creel census is conducted at Anderson Ranch Reservoir to monitor angler effort and fish population trends. Small-mouth bass contributions to the creel were evaluated by creel census estimates.

FINDINGS:

Idaho Fish and Game Department personnel, with the help of the department sponsored Explorer Scout Post, collected approximately 450 smallmouth bass by hook-and-line from Brownlee Reservoir during the first week in June, 1973. The bass ranged in length from 10 to 17 inches. Examination of hooking mortalities indicated that most of the bass had already spawned. The fish were held in live-boxes as captured, then trucked to Anderson Ranch Reservoir and planted by boat from Lime Creek to Little Bear Creek.

On August 8, underwater observations were made by three department personnel in Wilson Creek, Camas Creek and Little Bear Creek bays. Only three age class

types were seen. Yearling bass (3 to 4 inches in length) from last year's spawning, 5 to 8 inch bass from the fingerling release in 1972 and adult types (10 to 18 inches in length) from releases in 1972 and 1973 were observed. No young of the year were observed in the reservoir during the summer. Very few squawfish were seen in the bays that had good populations of bass.

The adult and fingerling bass have survived well in Anderson Ranch Reservoir. Anglers took an estimated 76 smallmouth bass from this reservoir this year. Most bass taken were in the 5 to 8 inch class from the fingerling releases in 1972. Stomachs from seven bass in this size group were examined and revealed fish remains in three out of the seven. Identification of the fish remains was not possible.

From our observations to date, it appears the bass are adapting well to their new environment. Growth has been good on the fingerlings and on the yearlings that were spawned last year. No bass fry were observed during 1973, but observations were limited. Continued bass transplants should pro-vide a fishable bass population at Anderson Ranch Reservoir within the next 3 or 4 years.

Submitted by:

Donald R. Beach
Fishery Research Biologist

Approved by:

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